

MEMO

Date **July 31, 2018**
To **Nevada Environmental Response Trust**
From **John Pekala, Scott Warner, and Chris Ritchie**
Copy to **Nevada Division of Environmental Protection**
Subject **United States Environmental Protection Agency**
Galleria Road ZVI-Enhanced Bioremediation Treatability
Study Monthly Progress Report

TASK PROGRESS UPDATE: JUNE 2018

At the direction of the Nevada Environmental Response Trust (NERT or Trust), Ramboll US Corporation (Ramboll) has prepared this memorandum which summarizes Ramboll's progress during June 2018 toward successfully implementing the Galleria Road ZVI-Enhanced Bioremediation Treatability Study.

TASK M18 – GALLERIA ROAD ZVI-ENHANCED BIOREMEDIATION TREATABILITY STUDY

- Task Leader – Scott Warner / Chris Ritchie
- Current Status
 - Phase 1 of treatability study (pre-design investigation and bench-scale testing) is underway. Bench-scale testing is in progress; pre-design field investigation is complete. Phase 2 (design and implementation of a field test) will be proposed later in 2018.
 - Single-borehole dilution tests were conducted at four monitoring wells (ES-33, ES-34, ES-35, and ES-36) the week of June 4th.
 - Nuclear Magnetic Resonance (NMR) logging was conducted at seven monitoring wells (ES-33 through 39) the week of June 4th.
 - Slug tests were conducted at four monitoring wells (ES-34, ES-37, ES-38, and ES-39) the week of June 11th.
 - Survey of three monitoring well locations was performed on June 14th (ES-37, ES-38, and ES-39). Survey coordinates, surface elevations (to top of monitoring well casing) and groundwater elevations are included in Table 2.
 - Bench-scale testing performed at the University of Nevada Las Vegas (UNLV) continues. Batch tests using a third grain size of ZVI have been performed. Batch microcosm tests with soil, groundwater, and ZVI to test biological perchlorate reduction are in progress and are expected to run for 3 to 6 weeks.
- Schedule and Progress Updates

- This task remains on schedule.
- Field work related to the pre-design field investigation is now complete.
- Batch microcosm tests to evaluate varying concentrations of nitrate and organic carbon are expected to begin mid-July.
- Health and Safety
 - There were no safety incidents related to Task M18 during July 2018.

ATTACHMENTS

Table 1 – Phase 1 Pre-Design Investigation Soil Boring Summary (Preliminary Information)

Table 2 – Phase 1 Pre-Design Investigation Monitoring Well Summary (Preliminary Information)

Figure 1 – Phase 1 Pre-Design Investigation Boring and Monitoring Well Locations (Preliminary Information)



Galleria Road ZVI-Enhanced Bioremediation Treatability Study Progress Update

Nevada Environmental Response Trust Site
(Former Tronox LLC Site)
Henderson, Nevada

Nevada Environmental Response Trust (NERT) Representative Certification

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee *not individually, but solely as President*

Signature: *Jay A Steinberg*, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Name: Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Title: Solely as President and not individually

Company: Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Date: *7/31/18*

Galleria Road ZVI-Enhanced Bioremediation Treatability Study Progress Update

Nevada Environmental Response Trust Site
(Former Tronox LLC Site)
Henderson, Nevada

Responsible Certified Environmental Manager (CEM) for this project

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Description of Services Provided: Prepared Galleria Road ZVI-Enhanced Bioremediation Treatability Study Progress Update, Nevada Environmental Response Trust Site, Henderson, Nevada



July 31, 2018

John M. Pekala, PG
Principal

Date

Certified Environmental Manager
Ramboll Environ US Corporation
CEM Certificate Number: 2347
CEM Expiration Date: September 20, 2018

TABLE 1: PHASE 1 PRE-DESIGN INVESTIGATION SOIL BORING SUMMARY (Preliminary Information)

Nevada Environmental Response Trust Site

Henderson, Nevada

Boring ID	Boring Total Depth (ft bgs)	Northing (meters)	Easting (meters)	Sample Depths (ft bgs)
ESB-19	35	8146484.332	253179.3197	10, 20, 30
ESB-20	40	8146563.872	253340.684	10, 20, 30, 40
ESB-21	40	8146599.838	253540.2664	10, 20, 30, 40
ESB-22	45	8146535.089	253723.9304	10, 20, 30, 40
ESB-23	45	8146751.406	253647.4086	10, 20, 30, 40
ES-33 (Pilot)	120	8146655.727	253194.3672	10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 40, 50, 60, 70, 80, 90, 100, 110, 120
ES-34 (Pilot)	120	8146673.622	253379.0012	10, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 50, 60, 70, 80, 90, 100, 110, 120
ES-35 (Pilot)	120	8146712.877	253535.9339	10, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 50, 60, 70, 80, 90, 100, 110, 120
ES-36 (Pilot)	120	8146742.077	253750.9373	10, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 50, 60, 70, 80, 90, 100, 110, 120

Notes:

ft bgs - feet below ground surface

Pilot - Soil boring associated with corresponding monitoring well. Drilled approximately 5 feet downgradient from monitoring well.

TABLE 2: PHASE 1 PRE-DESIGN INVESTIGATION MONITORING WELL SUMMARY (Preliminary Information)

Nevada Environmental Response Trust Site

Henderson, Nevada

Monitoring Well ID	Installation Date	Northing (meters)	Easting (meters)	Elevation (ft amsl)	Total Depth (ft bgs)	Screen Length (ft)	Screened Interval (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft amsl)
ES-33	4/14/2018	26727819.66	830688.49	1626.39	33	15	18 to 33	31.04*	1595.35
ES-34	4/17/2018	26727878.60	831294.61	1630.03	41	15	26 to 41	DRY	-
ES-35	4/15/2018	26727994.68	831812.43	1628.35	45	15	30 to 45	28.23*	1600.12
ES-36	4/17/2018	26728075.74	832531.15	1630.83	45	15	30 to 45	34.28*	1596.55
ES-37	4/27/2018	26727252.08	830634.29	1634.21	37	15	22 to 37	29.56*	1604.65
ES-38	4/27/2018	26727641.10	831828.20	1628.11	40	15	25 to 40	28.30*	1599.81
ES-39	4/30/2018	26727422.09	832407.53	1637.87	45	15	30 to 45	41.00*	1596.87

Notes:

*Depth to water following completion of well installation. Depth to water collected before development.

ft - feet

ft bgs - feet below ground surface

ft amsl - feet above mean sea level

Elevation at the measuring point is noted in the table.



Legend

- ◆ Deeper Boring
- ◆ Shallow Boring
- ◆ 4-inch diameter monitoring well

**Phase 1 Pre-Design Investigation Boring and Monitoring Well Locations
(Preliminary Information)**

Galleria Road ZVI-Enhanced Bioremediation Treatability Study
Nevada Environmental Trust Site; Henderson, Nevada

**FIGURE
1**

